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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,214	04/19/2004	Brian T. Holland	7774	2941

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EXAMINER	
METZMAIER, DANIEL S	
ART UNIT	PAPER NUMBER
1712	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/827,214	HOLLAND ET AL.	
	Examiner	Art Unit	
	Daniel S. Metzmaier	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 & 31 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,8,10-29,32 and 33* is/are pending in the application.

4a) Of the above claim(s) *12-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,8,10,11,32 and 33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/22 & 31/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-2, 8, 10-29 and 32-33 are pending.

Election/Restrictions

1. Applicant's election of Group I, claims 1-11 and 30-31, now claims 1-2, 8, 10-11 and 32-33, in the reply filed on 22 January 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

2. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 sets forth "A synthetic metal-containing colloidal silicate composition comprising: a metal-silicate lattice solid phase having colloidal particles". The instant specification sets forth (page 6, lines 14-20):

> The present invention generally relates to colloidal compositions and methods of preparing same. As used herein, the term "colloid" and other like terms including "colloidal", "sol", and the like refer to a two-phase system having a dispersed phase and a continuous phase. The colloids of the present invention have a solid phase dispersed or suspended in a continuous or substantially continuous liquid phase, typically an aqueous solution. Thus, the term "colloid" encompasses both phases whereas "colloidal particles" or "particles" refers to the dispersed or solid phase.

Since the colloidal composition and the colloidal particles are both contained in claim 1, the specification makes no distinction between the two, and are set forth as having a lattice solid phase, claim 8 defining the "colloidal particles as having a layered structure" is not further limiting.

Claim interpretation

3. The claims are drafted in product-by-process format. Attention is directed to MPEP 2113 for claim analysis of product-by-process claim limitations. Copolymerized as now claimed has basis at page 9, lines 15 et seq, discloses the term copolymerized and is characterized as a heel solution of silicic acid with a metallic cation. Said materials are further characterized as having a "metal-silicate lattice microstructure". Applicants (page 2, lines 29-30) characterize the colloidal particles as amorphous and spherical in shape, which may be further processed to produce crystalline structure.

Two structures appear to be set forth as the "metal-silicate lattice microstructure" and the macrostructure as amorphous or crystalline, wherein the microstructure results from the presence of the metal cation formation with the silicic acid to form the colloidal particles. Applicants are requested to clarify this interpretation to the extent that the claims preclude materials that are amorphous and have a "metal-silicate lattice microstructure".

The claims only define a upper limit for the metal species in the compositions (i.e., claim 2 and 11).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-2, 8, 10-11 and 32-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear whether applicants intend the lattice structure to define the microscopic arrangement between silica and metal cations in both amorphous and crystalline materials or that said materials are exclusive to crystalline materials.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al, US 5,597,512. Watanabe et al (examples and claims, particularly claims 4 and 5) disclose making silica sols having 972 ppm and 1156 ppm of CaO. Watanabe et al (examples and claims) disclose the use of sodium hydroxide as a stabilizer as well as quaternary ammonium compounds (claims 4 and 5) as stabilizers. Watanabe et al (claims) disclose the use of MgO or CaO in the form of metal salts with silicic acid. Watanabe et al (column 1, lines 5-15) disclose the use of the sols as surface coating agents. The claimed lattice structure would be inherent to the

Watanabe et al materials as the microstructure of the particles based on the divalent and tetravalent arrangement of the alkaline earth metal cations with the siloxy structure formed from the silicic acids.

8. Claims 1-2, 8, 10 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Finlayson et al, US 4,287,086. Finlayson et al disclose organic systems employing organophilic clay suspended in said organic systems. The organophilic clay is made organophilic by the addition of a quaternary amine. Said clay is inherently a layered material that is in colloidal form. Bentonite and hectorite are both montmorillonite clays. Hectorite is known to be a sodium/magnesium/lithium silicate. Bentonite is known as an aluminosilicates and would have had residual amounts of sodium/magnesium/calcium. The materials would have been expected to be inherently spherical since the said materials have not been otherwise stated.

9. Claims 1-2, 8, 10-11 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by S. Mintova et al, "Effect of the silica source on the formation of nanosized silicalite-1: an in situ dynamic light scattering study", Microporous and Mesoporous Materials, 55 (2002), pages 171-179. S. Mintova et al (2. Experimental) discloses the synthesis of nanosized silicalite-1 comprising tetrapropylammonium hydroxide (TPAOH) : 0.13 moles Na_2O : 25 SiO_2 in water and ethanol. The hydrothermal treatment results in the crystallized layered structure and the alkali metal, i.e., sodium is present in less than 2 wt% of silica. The materials would have been expected to be inherently spherical since the said materials have not been otherwise stated.

10. Claims 1-2, 8, 10-11 and 32-33 are rejected under 35 U.S.C. 102(a) as being anticipated by Cundy et al, "Some observations on the preparations and properties of colloidal silicalites. Part I: Synthesis of colloidal silicalite-1 and titanosilicalite-1 (TS-1)", Microporous and Mesoporous Materials, 66 (2003), pages 143-156. Cundy et al (page 146, 2.2 Preparation of TS-1sols) discloses the preparation of titanosilicalite-1 sols with TPAOH having 6 mole % of titanium metal and discloses as little as 1 mole % titanium metal. The 1 mole % equates to less than 2 wt % of metal based on silica. The materials would have been expected to be inherently spherical since the said materials have not been otherwise stated.

Response to Arguments

11. Applicant's arguments filed 22 January 2007 have been fully considered but they are not persuasive.

12. Applicants (pages 10 and 11) assert that since the Watanabe et al reference reduces the alkaline earth metal cations concentration in the colloidal sol by ultrafiltration, the alkaline earth metal cations are a separate phase. This has not been deemed persuasive for the following reasons:

(1) The claims are otherwise anticipated and applicants have not shown the asserted structure to be distinct from the materials of the Watanabe et al reference. It is further noted that the Watanabe et al metal cation concentrations read on applicants' claimed concentrations of metals.

(2) The claimed copolymerization does not distinguish nor exclude ionic bonding of the alkaline earth metal cations or their formation of alkaline earth silicates as covalently formed oxides.

(3) Lastly, the claims do not exclude bounds metal, i.e., copolymerized including ion-exchangable ions and free ions in the aqueous phase, which one skilled in the art would expect to be removed by ultrafiltration. Futher attention is directed to claim 10, which sets forth the metal as alkaline earth metals.

13. Applicants (pages 11 and 12) assert the Finlayson is directed to smectite clay treated with quaternary ammonium compounds rather than the claimed synthetic metal-containing colloidal silicate composition. Applicants recognize the Finlayson materials have a cation exchange capacity, claim 10 sets forth alkali metals as suitable metals and the materials of Finlayson are synthetic since they are ion-exchangable and treated with amines.

14. Applicants (pages 12 and 13) assert the Mintova is directed to zeolite compounds rather than the claimed synthetic metal-containing colloidal silicate composition. Applicants recognize the Mintova materials have a cation exchange capacity, claim 10 sets forth alkali metals as suitable metals and the materials of Mintova are synthetic since they are ion-exchangable and treated with amines.

15. Applicants (pages 12 and 13) assert the Cundy is directed to zeolite compounds rather than the claimed synthetic metal-containing colloidal silicate composition. Applicants recognize the Cundy materials have a cation exchange capacity, claim 10

sets forth alkali metals as suitable metals and the materials of Cundy are synthetic since they are ion-exchangable and treated with amines.

16. Applicants' claims do not specifically define what is intended by copolymerized regarding the formation of the inorganic sols. Claims are given their broadest reasonable interpretation in light of the specification during prosecution. A review of the specification does not provide a specific definition of the copolymerization and said limitation is deemed to read on ionic copolymerization of the silicic acid species.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the IDS forms is less pertainate or cumulative to the above art relied.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel S. Metzmaier
Primary Examiner
Art Unit 1712

DSM